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| EXAMINER |
|-------------------|
| LEUNG, JENNIFER A |

| ART UNIT | PAPER NUMBER |
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| 1764 | |

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/987,932

Applicant(s)

KIRKBRIDE ET AL.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-34, 39-49, 52 and 53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-34, 39-49, 52 and 53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Jennifer A. Leung
May 17, 2007

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 12, 2007 has been entered.

Response to Amendment

2. Applicant's amendment submitted on March 12, 2007 has been received and carefully considered. Claims 1-22, 35-38, 50, 51 and 54 are cancelled. Claims 23-34, 39-49, 52 and 53 are under consideration.

Claim Objections

3. Claims 23 and 34 are objected to because of the following informalities:
"95 vol. % or greater" (in line 11) should be changed to --95 mole % or greater--, as supported on page 26, line 3 of the specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 23-34, 39-49, 52 and 53 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter

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which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 23 and 34, it is unclear as to where the newly added temperature range within the limitation of, "said reactor system having means for feeding said fluidizing medium at a temperature in a range of from 800 °F to 1500 °F," is supported in the original disclosure. It is noted that the specification, for example, only provides support for the following temperature point values for the fluidizing medium, i.e., for the hydrogen inlet temperature to the reactor:

- 1500 °F (page 30, line 29) or about 1500 °F (page 25, line 2)
- 1200.00 °F (page 17, line 35; page 20, line 30) or about 1200 °F (page 13, lines 11, 12)

Furthermore, it is unclear as to where the newly added temperature range within the limitation of, "a fluidized bed temperature in a range of from 800 °F to 1200 °F," is supported in the original disclosure. It is noted that the specification, for example, only provides support for the following temperature point values or temperature ranges for the fluidized bed, i.e., for the reaction temperature:

- about 900 °F to about 1000 °F (page 25, lines 6-7)
- between 800 °F and 900 °F, preferably closer to 800 °F (page 8, line 22)
- 800.00 °F (page 17, line 17)
- 950 °F (page 30, line 22)

Furthermore, it is unclear as to where the concentration range within the limitation of, "off gas comprising 0.30 vol % or less CO," is supported in the original disclosure. It is noted that the

specification, for example, only provides support for the following CO concentration point values:

- CO at 0.30 % (specification, page 16, line 37. There is no indication as to whether the concentration is given as vol %, or as some other basis. Other portions of the specification appear to suggest the use of a wt % basis)
- CO at 0.05 wt % (specification, page 20, line 50)

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 23-27, 29, 30, 34, 39-43, 45 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Gregoli (US 4,075,081).

Regarding claims 23 and 34, Gregoli (see figure; column 5, lines 3-55) discloses an apparatus comprising:

a fluidized bed reactor (i.e., hydroretorter **9**; column 4, lines 1-3) having a fluidized bed, free of a contained catalyst bed (see column 4, line 45 to column 5, line 2);

said reactor **9** comprising a feed inlet connected to a source of fluidizable feed (i.e., in

communication with line **8**), a fluidizing medium inlet connected to a source of fluidizing medium (i.e., in communication with line **11**), and an outlet for off gas (i.e., in communication with line **12**);

means (i.e., lines **2,8**, including a pumping means, not labeled) for continuously feeding said feed

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to the reactor 9;
means (i.e., line 11, including a compressor 20) for continuously feeding the fluidizing medium;
means (i.e., a heater 10) for feeding the fluidizing medium at a temperature in the range of from
800 °F to 1500 °F (i.e., the heater 10 is structurally capable of supplying the fluidizing
medium at an elevated temperature, e.g., at about 800 °F; see EXAMPLE); and
an outlet for spent solids (i.e., in communication with line 12, to line 14).

Please note that expressions relating the apparatus to contents thereof during an intended operation are of no significance in determining patentability of the apparatus claim, *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969), and the inclusion of a material or article worked upon by a structure being claimed does not impart patentability to the claims, *In re Young*, 75 F.2d 966, 25 USPQ 69 (CCPA 1935); *In re Otto*, 312 F.2d 937, 136 USPQ 458, 459 (CCPA 1963). Therefore, the recitations with respect to the particular feed materials being worked upon by the apparatus (i.e., a tar sand feed comprising a bitumen, an oil shale feed comprising a kerogen, hydrogen at a concentration of 95 vol. % or greater) add no further patentable weight to the apparatus claims. Additionally, the recitations with respect to the particular products formed by the apparatus (i.e., an off gas comprising 0.30 vol. % or less CO) add no further patentable weight to the apparatus claims. Furthermore, the recitations of particular process conditions (i.e., a fluidizing medium temperature in a range of from 800 °F to 1500 °F, a fluidized bed temperature in the range of from 800 °F to 1200 °F, an operating temperature in the range of 50 °F to 1500 °F) add no further patentable weight to the apparatus claims.

In any event, with respect to claim 34, Gregoli discloses that the feed materials may include a fluidizable feed comprising an oil shale feed with kerogen (see column 2, line 66 to

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column 3, line 16) and a fluidizing medium comprising hydrogen gas (i.e., supplied via make up line 19, or recycled). Furthermore, Gregoli discloses that the fluidizing medium may be fed to the reactor 9 at a temperature of about 800 °F (see EXAMPLE), and the bed temperature may be from about 600 °F to 900 °F (see column 4, lines 3-9; also, claims 1 and 2).

Regarding claims 24 and 40, a hydrogen recycling system (i.e., with a “hydrogen recycle” line and separators 16,18; see Figure) is positioned downstream from the off gas outlet.

Regarding claims 25, 26, 41 and 42, a separator (i.e., comprising cyclone separators 13) removes entrained solids from the reactor product gas.

Regarding claims 27 and 43, Gregoli discloses that the feed inlet (i.e., in communication with line 8) and the fluidizing medium inlet (i.e., in communication with line 11) are positioned for co-current flow of the feed and the fluidizing medium through the fluidized bed (see figure; also, column 5, lines 19-20).

Regarding claims 29 and 45, a heat exchanger 17 recovers heat from a gas having a component which has exited the reactor 9 (see figure).

Regarding claims 30 and 46, a gas-liquid separator (i.e., separator 16; see figure; also, column 5, lines 28-32) separates a condensable hydrocarbon having exited the reactor 9.

Regarding claim 39, Gregoli further discloses a feed introducing system (i.e., comprising crushing and grinding unit 1 and feed line 2; see figure). The recitation with respect to the feed being maintained at “a temperature of about 100 °F or lower” is considered a process limitation that adds no further patentable weight to the apparatus claim.

Instant claims 23-27, 29, 30, 34, 39-43, 45 and 46 structurally read on the apparatus of Gregoli.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 28, 32, 33, 44, 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregoli (US 4,075,081) in view of Schlinger et al. (US 3,224,954).

Gregoli (see figure and column 5, lines 28-49) discloses that the hydrogen recycling system comprises a separating device (i.e., separator **16, 18**) for removing a portion of hydrocarbon from the reactor off gas, to produce a recycle hydrogen gas stream; a make-up hydrogen feed stream (i.e., via line **19**); a mixing device (i.e., the junction of line **19** and the hydrogen recycle line; see figure) for admixing the recycle hydrogen and the make-up hydrogen feed to form a hydrogen mixture; a heater **10** for heating at the mixture of recycle hydrogen and make-up hydrogen; and a compressor **20** for pressuring the recycle hydrogen stream.

The hydrogen recycling system in Gregoli is the same as the instantly claimed hydrogen recycling system, except that the compressor **20** is positioned such that it only compresses the

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recycle hydrogen stream, and not the stream comprising at least the make-up hydrogen, or both the recycle hydrogen and the make-up hydrogen.

Schlinger (see FIG. 1) teaches a hydrogen recycling system in which a compressor **10** is used for compressing both a make-up hydrogen (i.e., supplied via line **11**) and a recycle hydrogen stream (i.e., in line **9**) obtained from a separating device **8**, where the compressed stream containing the recycle and the make-up hydrogen is fed to a heater **2**.

It would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to reposition the compressor **20** in the hydrogen recycling system of Gregoli, such that the compressor **20** compressed at least the make-up hydrogen, or both the recycle hydrogen and the make-up hydrogen, on the basis of suitability for the intended use and absent a showing of unexpected results thereof, because the shifting of the location of parts was held to have been obvious, *In re Japikse*, 181 F.2d 1019, 1023, 86 USPQ 70, 73 (CCPA 1950); and the claimed positioning of the compressor in the hydrogen recycling system would have been considered conventional in the art, as evidenced Schlinger. In addition, the two compressor positions within the hydrogen recycling system would have been recognized as equivalents for performing the same function of feeding hydrogen gas to the reactor under a pressurized state.

7. Claims 31 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregoli (US 4,075,081) in view of Fleck (US 4,125,597).

Gregoli discloses that, “[t]he overhead gas stream from **18**, containing H₂S and ammonia, can be sent to a purification zone, not shown...” (column 5, lines 34-36). Gregoli, however, is silent as to the purification zone comprising a scrubbing system.

Fleck (see Figure; column 6, lines 3-30) teaches a scrubbing system **10** comprising

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scrubbers **34**, **36** for purifying a gas stream **12** containing H₂S as a pollutant.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a scrubbing system in the purification zone in the apparatus of Gregoli, on the basis of suitability for the intended use thereof, because the scrubbing system would allow for the hydrogen sulfide, which is an atmospheric pollution, to be removed from the system.

8. Claims 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gregoli (US 4,075,081) in view of Tassoney et al. (US 3,715,301).

Gregoli is silent as to whether the feed inlet and the fluidizing medium inlet may be positioned for countercurrent flow of the feed and the fluidizing medium through the fluidized bed in the reactor **9**.

Tassoney et al. teaches a fluidized bed reactor **17** wherein the feed inlet (i.e., in communication with line **16**) and the fluidizing medium inlet (i.e., in communication with line **18**) are positioned for countercurrent flow of the feed and the fluidizing medium through the fluidized bed (see figure; column 4, line 74 to column 5, line 38).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the feed inlet and the fluidizing medium inlet for countercurrent flow of the feed and the fluidizing medium through the fluidized bed in the apparatus of Gregoli, on the basis of suitability for the intended use thereof, because the countercurrent flow configuration for retorting a feed material, e.g. oil shale, with hydrogen is conventional in the art, as evidenced by Tassoney et al. Furthermore, the substitution of a countercurrent flow configuration for a cocurrent flow configuration of the feed and the fluidizing medium through the fluidized bed would have been considered obvious to one of ordinary skill in the art, since both configurations

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would have been recognized as equivalents for performing the same function of hydro-retorting in substantially the same way, to produce substantially the same results.

Response to Arguments

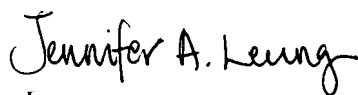
9. Applicant's arguments filed March 12, 2007 have been fully considered but they are moot in view of the new grounds of rejection, necessitated by amendment.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Jennifer A. Leung
May 17, 2007